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IN THE

# Supreme Court of the United States

OCTOBER TERM—1939

No. 9

STANDARD BRANDS INCORPORATED,

*Petitioner,*

*vs.*

NATIONAL GRAIN YEAST CORPORATION;

*Respondent.*

# BRIEF FOR PETITIONER

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Respondent.

## BRIEF FOR PETITIONER

This Petition for Writ of Certiorari to the United States Circuit Court of Appeals for the Third Circuit involves three Hayduck patents, numbered 1,449,103, 1,449,105 and 1,449,106, owned by petitioner. For convenience, these will hereafter be referred to by their last three digits, as –103, –105, and –106.

The Petition was granted only as to the question of validity of each patent.

### OPINIONS BELOW REPORTED

The opinion of the Circuit Court of Appeals below (Biggs, *C. J.*) is reported at 101 F. (2d) 814 and is found at R. I., 668; the opinion of the trial Court (Fake, *D. J.*) is reported at 21 F. Supp. 46 and is found at R. I, 626.

The conflicting opinion of the Circuit Court of Appeals for the Fourth Circuit on patent –103 in *Federal Yeast Corporation* v. *Fleischmann Co.*, is reported at 13 F. (2d) 570; affirming the trial Court's opinion (Soper, *D. J.*) in *Fleischmann Yeast Co.* v. *Federal Yeast Corporation*, reported at 8 F. (2d) 186. The latter Court's opinion on the accounting is reported at 38 F. (2d) 314.*

The conflicting opinion of the same District Court on patents –105 and –106 in *Standard Brands, Inc.* v. *Federal Yeast Corporation*, is reported at 38 F. (2d) 329.**. This opinion was handed down simultaneously with that in the accounting proceedings on patent –103 and shortly thereafter the entire litigation in Maryland was ended by settlement in which the defendant was enjoined from further infringement of the three patents and made payment to petitioner of a large sum of money for past infringement.

## JURISDICTION

The grounds on which jurisdiction of this Court is invoked are:

(1) The conflict of decisions noted above.

(2) The decision of the Circuit Court of Appeals, for the Third Circuit in the instant case to the effect that patents –103 and –105 may be used as prior art against patent –106, (even though they were filed by the same applicant, claim distinct inventions and issued on the same date) is in direct conflict with the weight of authority and is an important question of general patent law.

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* This will be hereinafter referred to as the "first Maryland litigation". Petitioner is the successor in business to the Fleischmann Yeast Company.

** This will be hereinafter referred to as the "second Maryland litigation".

## STATEMENT OF THE CASE

The three patents claim novel and commercially important processes of manufacturing compressed yeast which is used by bakers as a leavening agent for bread and like bakery products. The patented inventions are capable of conjoint use and have been so used by petitioner.

The following general statement of Judge Soper of what yeast is and how it is grown is concise and not in dispute.

> "The product [bakers' yeast], which is used in the baking industry, must possess special qualities and properties. * * * Bakers' yeast forms the right amount of gas, is favorable to the texture of the bread, and does not have an offensive taste or odor. It is of suitable color. Moreover, it has lasting qualities, while many other varieties rapidly deteriorate and become a slimy unattractive mass, unsuitable for bread making.
>
> Yeast is a small cellular micro-organism. In its ordinary significance, it is a conglomerate mass of infinitesimally small cells. It multiplies by self propagation, limited by the means of subsistence, and the quality and yield are greatly affected by the conditions under which propagation is carried on. Yeast has been manufactured for at least 50 years by inoculating a wort; that is, by preparing a clear liquid solution and stocking it with a small amount of seed yeast. Such worts include substances to nourish the yeast cells, and are called yeast nutrient solutions. * * * The field for investigation and improvement has been the composition of the nutrient solution, and the character of the process employed during the period of growth." (8 F. (2d) p. 187)

In the manufacture of bakers' yeast, the composition of the nutrient solution and the chemical and procedural control imposed during the propagating period affect both the quality and amount of the product obtained, and these factors of worth and cost of the product determine the utility and value of any given process.

## The First Patent and Decisions on It

Claim 1, for example, of patent -103 defines the new process thereby covered. It reads:

> "The process of manufacturing yeast which comprises preparing a yeast nutrient solution and propagating yeast therein with aeration, said yeast nutrient solution containing essentially sugar material and yeast nourishing inorganic salts from which components are liberated which tend increasingly to acidify the nutrient solution during propagation, and during the period of propagation neutralizing the deleterious excess of such acidity." (R. II, 3; off'd R. I, 50).

It is to be noted that the process thus claimed comprises (a) specified composition of nutrient solution, and (b) specified chemical control. These factors are specified in combination.

In the first Maryland litigation, this patent was held valid over the prior art, and infringed. On appeal, the Court of Appeals for the Fourth Circuit made the same holding. The case was referred to a Special Master for accounting and his report on the broad, valid scope of the patent (infringement) was confirmed by the trial court prior to defendant's settlement in which appeal was waived.

In the present case, the District Court likewise held the patent valid over the prior art. He agreed in part and disagreed in part with Judge Soper as to the patent's scope (infringement). On appeal, the Circuit Court of Appeals below held the patent invalid over the prior art but did not pass on infringement*.

Thus, the two trial courts and the Circuit Court of Appeals for the Fourth Circuit have found the patent valid, while the Circuit Court of Appeals below has found it invalid.

---

* There is a partial conflict between the two trial courts with respect to infringement, but that issue is not now on review.

## The Second Patent and Decisions on It

Claim 10, for example, of patent –105 defines the new process thereby covered. It reads:

> "A process of propagating yeast with a relatively low yield of alcohol which comprises, preparing a wort containing all essential yeast nutrients in solution, initiating propagation of yeast in a highly diulted portion of said wort, aerating the diluted portion, and substantially continuously adding during the period of propagation, the wort of higher concentration at a rate such that the concentration of the dilute wort remains substantially constant, whereby substantially all of the alcohol which may be formed is assimilated." (R. II, 7; off'd R. I. 50)

It is to be noted that the process of this claim comprises a specified plurality of procedural steps in prescribed sequence and in combination.

In the second Maryland litigation, the District Court held the disclosure adequate and the patent valid over the prior art, and infringed. Defendant settled without appeal.

In the present case the District Court held the patent invalid only on the ground of insufficient disclosure. On appeal, the Circuit Court below held the patent invalid over the prior art (a ground not mentioned by the trial court) and also on the ground of indefiniteness.

## The Third Patent and Decisions on It

Claim 13, for example, of patent –106 defines the new process thereby covered. It reads:

> "A process of propagating yeast with a relatively low yield of alcohol which comprises initiating propagation of yeast in a dilute nutrient solution comprising essentially sugar material and yeast nourishing inorganic salts, from which components are liberated

> which tend increasingly to acidify the nutrient solution during propagation, aerating the solution, during the period of propagation adding thereto substantially continuously sugar material and yeast nourishing inorganic salts, at a rate such that the concentration of the solution in which the yeast is propagating is maintained substantially constant, and during the period of propagation neutralizing a substantial portion of such acidity by the addition of an innocuous antacid substance." (R. II, 10; off'd R. I, 50)

It will be noted that the process thus claimed comprises (a) specified composition of nutrient solution, (b) specified chemical control during propagation, and (c) specified steps in prescribed sequence, all in combination. Actually, this patent claims a unitary process in which the factors of the –103 process and of the –105 process are integrally combined.

In the second Maryland litigation, the District Court held the patent valid over the prior art and infringed. As to this patent also defendant settled without appeal.

In the present case, the District Court held it invalid on the sole ground that having held patent –105 invalid "its combination with a valid patent adds nothing to the art". (R. I, 634) The Circuit Court of Appeals below likewise held it invalid on the sole ground that

> "combining the processes of invalid process patents [–103 and –105] cannot result in validity". (R. I, 684)

## Respondent's Position

It is the position of respondent that earlier patents and publications made disclosures which anticipated the claimed subjects matter of the three patents or which approxmated them so closely as to exclude the exercise of patentable invention in originating them.

As to patent –103, the Circuit Court of Appeals below adopted the latter defense premised on four items of the prior art, i.e., an abstract in English of an article in Ger-

man, dated 1908 by Henneberg (R. II, 158); a corresponding article derived from the German publication but published in English in the magazine "Pure Products", May 1908 (R. II, 162); 3 pages from a 200 page book in German published in Vienna in 1890 by Wilfert (R. II, 171); and a Swiss patent of 1913 to Pollak (R. II, 151).

As to patent –105, the same Court sustained the defense premised on two items of the prior art, i.e., a German patent of 1879 to Rainer (R. II, 135) and an abstract in English published in 1903 in the Journal of the Society of Chemical Industry (R. II, 157) of an article published in Germany by Iwanowski. All of these items of prior art were offered in one book at R. I, 160.

As to patent –106, the same Court sustained the defense that the inventor's simultaneously filed and issued patents –103 and –105 constituted prior art and that the integration of the respective processes of the earlier numbered* patents into a unitary process possessing more than the additive advantages of each was not validly patentable.

## Petitioner's Position

It is petitioner's position, *contra,* that no patent or publication of the prior art makes a self-contained disclosure of the process defined in any claim in issue of the patents; that prior piecemeal and nebulous disclosures of isolated steps may not tenably be assembled, *post* the patented inventions, to depict what was obvious to the art *ante,* save under other convincing indications of obviousness not shown in the presen record; and that the practical commercial results accomplished by the pat-

* Actually the three patents issued on the same day (March 20, 1923), on applications filed in the United States on the same day under the provisions of the Act of March 3, 1921, 41 Stat. L. 1313 (the so-called "Nolan Act"), and correspond to separate applications filed abroad in the Spring of 1915.

ented processes stamp the subjects matter as derived from the exercise of patentable invention.

The practical commercial results referred to are a superior yeast product of improved baking strength, keeping quality and uniformity, and improved processes of greatly augmented yields per unit of raw materials, of great savings in the cost of raw materials, of savings in time of production, of savings in labor cost, of enhancement of plant capacities, of savings in shipping charges, all of which have been reflected in benefit to the industry and to the consuming public. These recited advantages are summarized in the opinions of Judge Soper, 8 F. (2d) p. 198; 38 F. (2d) p. 323, and 38 F. (2d) p. 337. They are not commented on in either opinion of the Courts below.

## The Issues

The primary issue before this Court, therefore, is whether the patented inventions as defined by the claims in controversy are to be judicially deemed resultant from the exercise of patentable invention, on the one hand, or from the routine skill of the ordinary worker in the art, on the other hand.

As to patent -105, there is a secondary issue of sufficiency of disclosure to comply with the statutory requirements. On this it is respondent's position, sustained below, that the patent insufficiently teaches the rate of feeding the concentrated nutrient solution into the dilute nutrient solution during the propagating period. It is petitioner's position that the instruction of the patent is adequate in this regard and in full compliance with the statutory requirements. On this secondary issue the parties are in conflict more on the applicable law than on the facts.

As to patent -106, there is also the issue as to whether it is good law to use an inventor's copending applica-

tions to prevent his obtaining valid combination claims to a unitary process comprising an integration of his own separte inventions.

## SPECIFICATION OF ERRORS

The error urged is that the Circuit Court of Appeals for the Third Circuit erred in holding the issue claims of the patents invalid. More particularly, error is urged in the holding that there was no exercise of patentable invention over the prior art in devising the subjects matter of the patents in suit, in the holding that the disclosure of patent –105 is insufficient to comply with the statutory requirements; and in the holding that patent –106 is invalid "since combining the processes of invalid process patents cannot result in validity".

## SUMMARY OF ARGUMENT

1. Patents disclosing and claiming subject matter which is new and which has made a vital impress on its related commercial industry should be sustained.

(a) The inventions of the present patents have revolutionized the yeast manufacturing industry.

2. Patents which claim processes comprising a plurality of steps in prescribed sequence in prescribed combination and cooperating to a new or better or more economical result should not be invalidated by mere proof that the several steps separately or in different sequence or in different combination operating to a different result were old prior to the inventions of the patentee; especially when as here the references are of foreign origin and are vague, ambiguous and incomplete.

(a) The present patents contain claims for processes comprising specified steps and sequence of steps, in combination.

(b) No item of the prior art singly shows any process claimed herein. Such items were not singly nor collectively responsible for the industrial advance made by Haydueck.*

(c) Under the statutes, the patents in suit are valid.

* In view of the favorable decisions in the Maryland litigation, and the refusal of the District Court below to find any anticipatory disclosures in the prior art, and the discussions of only certain items of the prior art in the opinion of the Circuit Court of Appeals below, we shall in this main brief confine our attention to those references only which are mentioned in the latter opinion. It may be fairly assumed that the non-acceptance heretofore by all the Courts of any defense based on other pleaded references is sufficient confirmation of the presumption that the validity of the patents in suit is not adversely affected by such other references. If respondent's brief asserts otherwise, we shall treat the matter in a reply brief.

## ARGUMENT

The Court has well stated:

> "In administering the patent law the court first looks into the art to find what the real merit of the alleged discovery or invention is and whether it has advanced the art substantially. If it has done so, then the court is liberal in its construction of the patent to secure to the inventor the reward he deserves."

*Eibel Process Company* v. *Minnesota & Ontario Paper Co.*, 261 U. S. 45, 63.

### The Patented Inventions Have Revolutionized the Art

The record herein establishes that the patented inventions have revolutionized the art of yeast manufacture. Petitioner is the successor to the Fleischmann Company and is the largest manufacturer of bakers' yeast in the United States. The business has continued for more than seventy years. The commercial history of yeast manufacture in the United States for this period is fully reflected by the petitioner's operations as testified to in the Maryland litigations and in the present case. The evidence was not disputed in either case. It was briefly outlined in the opinion of Judge Soper, 8 F. (2d) p. 188), and was substantiated in the present case by the witnesses Lutz (R. I, 98-103) and Kaltenbach (R. I, 331-2). Judge Soper described the history as follows:

> **O. P. Process**—"In 1904, and for a long time prior thereto, the Fleischmann Company was using the so-called old process (O. P.) in which the raw materials for the nutrient solution consisted entirely of cereals, to wit, corn, rye, and barley malt. The average yield of yeast amounted to 12 per cent. of the raw material, and at the same time there was produced about 7 gallons of alcohol for each 100 pounds of material."

**N. P. Process**—"About 1911 a new process (N. P.) was introduced. In it, corn, corn malt, barley, malt, and malt sprouts were used. The most important change was the introduction of a process of aeration in which air was forced through the wort for the purpose of furnishing oxygen and thereby stimulating the multiplication of the yeast. The nutrient for the yeast was still obtained from cereal sources—sugar from the corn, and nitrogen from organic material, such as malt sprouts. From the new process, there were obtained average yeast yields of 28 per cent. of the raw material, and a certain amount of alcohol."*

**G. B. Process**—"In 1913, the Fleischmann Company modified its manufacture by adopting the German Bakers' (G. B.) process. This was practically the same as the N. P., except that corn malt was eliminated, and there was stronger aeration. Sugar and nitrogen were still obtained from organic sources. The average yeast yield was increased to about 35 per cent., and the alcohol yield was about 2½ gallons per 100 pounds of material."

**G. B. M. Process**—"In 1917, the G. B. process was superseded by what was called the German Bakers' Molasses (G. B. M.) process. This was during the war period, and it was necessary to conserve grain. Molasses was substituted for corn. With this process an average yeast yield of 33 per cent. was obtained, and about the same alcohol yield as before. With the exception of the substitution of molasses for corn, the process in other respects was the same as the G. B. process. It is noteworthy that this process represented the best method known to the Fleischmann Company in the manufacture of yeast from molasses, and, secondly, that although the method was cheaper, the yeast product was of a somewhat inferior quality. On the latter account, the company reverted to the G. B. method as soon as the government restrictions on grain were removed in 1918, notwithstanding an increased cost of production."

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* Luce—2½ gallons (R. I, 100).

**A. M. Process***—"This was the situation until 1919, when the Fleischmann Company, having acquired by assignment the inventions covered by the patents in suit, began the manufacture of yeast under the processes therein disclosed. The change is described as revolutionary. The use of cereals was abandoned entirely, and the wort was made from beet molasses, with the addition of ammonium phosphate and of aqua ammonia, added fractionally during the process. The solution therefore contained nutriment from both organic and inorganic sources. The yield of yeast was increased to 65 per cent. of the materials, and it was no longer necessary to make alcohol along with the yeast." (8 F. (2d) p. 188)

All of the above processes were of the "straight-set" type wherein the ingredients were all placed together with the seed yeast in the propagating vat at substantially the commencement of the propagation and wherein the nutrient content of the solution progressively decreased during the period of propagation (R. I, 102; 38 F. (2d) pp. 330-331).

In 1923 plaintiff adopted the "Zulauf" or "regulated feeding" process employing molasses and inorganic ammonium salts with neutralization, in which the propagation was initiated in a dilute portion of the nutrient solution and more concentrated reserve solution was continuously added during propagation at a rate to maintain the nutrient content of the solution substantially constant at an optimum during the propagating period. The "Zulauf" process is generically shown and claimed in patent –105. The perfected process using also inorganic ammonium salts and neutralization is shown (and specifically claimed) in patent –106. Both constitute radical departures from prior commercial practice. The use of the process resulted in the yield being increased to 80% on the raw materials with no undesired alcohol production (R. I, 103-6, 127-8). In some of its plants petitioner also used the process with grain worts as spe-

* This is shown and broadly claimed by Hayduck –103.

cifically shown in patent –105 (R. I, 104). With respect to the "Zulauf" process of patents –105 and –106 Judge Soper, in the second Maryland case, said:

> **Zulauf Process**—"The important feature of the process disclosed by this patent relates to the method in which the mash or wort is introduced into the propagating vat. A feeding process, referred to in the testimony as the Zulauf feed, is prescribed, whereby a comparatively small part of the nutrient solution is diluted, placed in the vat and seeded with yeast, and, after it has begun to grow and propagate, the remainder of the wort is fed in gradually to supply its increasing needs. As we shall see, this change has been accompanied by a great increase in the yield of yeast from raw material in the modern yeast factory." (38 F. (2d) p. 331)
>
> "* * * The present method of the plaintiff is to combine the process of patent –103 with that of patent –105 [which combination is the process of patent –106] and the result has been a substantial increase in yield, so that there is now obtained an average of 80% of yeast from the raw material." (*id.* p. 337, bracketed insert ours.)

On the important matter of commercial history, the opinion of the Circuit Court of Appeals below is so incomplete as to be inaccurate. It also mistates the prior holding of Judge Soper. It says:

> "The art of manufacturing yeast is a very old one. * * * Originally nutrient solutions were prepared by souring cereals with water in souring tanks, such cereals including corn, rye, barley and malt, all of which are organic materials as distinguished from inorganic materials. * * * When the souring process had continued sufficiently, the nutrient solution or wort thus attained was drained off and put with the seed yeast into the fermenting tank where the actual propagation of yeast from the seed yeast took place. In later years, particularly during the course of the World War which required conservation of grains, molasses was used as the source of sugar in the making of nutrient solutions in lieu of cereals.

> In 1919 inorganic salts capable of nourishing yeast were used in place of organic nitrogenous materials. This forward step in the art properly may be described as revolutionary. Judge Soper in Fleischmann Yeast Co. v. Federal Yeast Corporation so described it. With comparatively immaterial changes this method of producing nutrient solutions is substantially that used today." (R. I, 671-72)

Judge Biggs compressed three errors of fact into the language just quoted namely:

First, his statement of the 1919 improvement is incomplete to the extent that it becomes mis-descriptive. The improved process as adopted comprised, in combination, the factor of using yeast nourishing inorganic salts and the factor of neutralizing the *deleterious excess* of acidity resultant from such salts during the period of propagation. That is, the 1919 commercial process was the process in its entirety of the –103 patent, and was not the lesser step which Judge Biggs stated it to be.

Second, Judge Biggs then says that the lesser steps (not Hayduck's patented invention) "properly may be described as revolutionary" and that Judge Soper "so described it". This latter is not true. It was in fact the *complete* invention of the –103 patent which constituted the 1919 "forward step" described as "revolutionary" by Judge Soper. The latter's opinion is very specific on the point. He said:

> "Specifically it (patent –103) relates to a process for the production of bakers' yeast by propagation in a solution containing sugar materials and yeast-nourishing inorganic salts. * * * **This, however, is but a part of the process.** The specification of the patent shows that there takes place in such solutions a considerable increase of acid content, for the most part of an inorganic nature. * * * The accumulation of acid products or free inorganic acids influences the yeast unfavorably, if permitted to act unrestrainedly

upon the yeast for any considerable length of time. Hence the inventor, in order to prevent the harmful effect of the acid upon the yeast, teaches a special means of control by the addition of an antacid substance. * * * **The advantage of the process is that by the supply of nutriment through the addition of inorganic salts and by the neutralization at the same time of the deleterious effect of the discarded acid radicals of the inorganic salts, unprecedented yeast yields may be obtained**" (8 F. (2d) p. 189).*

And, describing this 1919 commercial change, Judge Soper said:

> "This was the situation until 1919, when the Fleischmann Company, having acquired by assignment the inventions covered by the patents in suit, *began the manufacture of yeast under the processes therein disclosed.* The change is described as revolutionary" (8 F. (2d) p. 188).

Thus it was the adoption of the complete –103 Hayduck process which constituted the 1919 change in commercial practice and which Judge Soper endorsed as "revolutionary." Both contrary statements of Judge Biggs are in plain error.

THIRD, the Court below made no mention of the notable commercial change introduced in 1923 and used today, which comprised the adoption of the full inventions disclosed and claimed in Hayduck's patents –105 and –106, and which Judge Soper correctly found was "accompanied by a great increase in the yield of yeast from raw materials in the modern yeast factory", and **"these yields are unprecedented in the yeast industry"** (38 F. (2d) pp. 331 and 337).

The Court apparently failed to take into consideration the fact that plaintiff had up to the date of trial, October 1935, already made over two billion pounds of yeast under

* Emphasis ours throughout.

patent –103 and that the patented invention had been paid the tribute of appropriation by the Federal Yeast Corporation (defendant in the Maryland litigations), and by respondent.*

That the introduction of the regulated feeding process was accompanied by a large increase in yield was admitted by respondent's witness Rautenstrauch (R. I, 244), who said that for over fifty years the commercial art had been using the straight-set mash, (R. I, 217), despite its low yields. The Court below apparently failed to credit patents –105 and –106 with these admissions or with the facts that the defendant Federal had likewise paid tribute to these patents by appropriating their inventions and that petitioner had up to the time of trial made over one billion seven hundred million pounds of yeast thereunder (R. I, 105).

It is established that the invention claimed in the patents revolutionized the commercial art. Patent –103 jumped the yeast yields from 35% for the best prior practice, to 65%, and other advantages of superior quality, increased plant capacity, and the savings indicated above also accompanied the change (R. I, 102-105). Likewise, the broad Zulauf invention of patent –105 and the specific climaxing invention of patent –106 when adopted in 1923 further jumped the yeast yield to 80% on the basis of raw materials with still further improvement in quality (R. I, 103-105).

The patented inventions have, therefore, fully met what this Court has defined as the first test to apply, and are entitled to receive the consideration which this Court holds shall follow, as set forth in the case of *Eibel Process Company* v. *Minnesota & Ontario Paper Co.*, 261 U. S. 45, 63, quoted *supra* p. 11.

Some years earlier, Judge Ward expressed the same principle in words which likewise crystallize sound fundamentals of the American patent law.

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* Respondent conceded at the trial that it had infringed patent –103, if valid (R. I, 627).

"The keynote of all the decisions is the extent of the benefit conferred upon mankind. Where the court has determined that this benefit is valuable and extensive it will, we think, be difficult to find a well considered case where the patent has been overthrown on the ground of nonpatentability."

*O'Rourke Engineering Const. Co.* v. *McMullen et al.*, 160 Fed. 933, 939, (C. C. A. 2).

## The Prior Commercial Art Is Non-Anticipatory

This prior commercial history makes it clear that the patented processes were new, and validly patentable.

(a) Until after the effective dates of the patents the commercial practice always comprised using organic materials (such as corn, rye, corn malt and barley malt) as the exclusive source of nutrients to carry on the yeast propagation.

(b) The commercial practice also was always "straight set", i.e., the entire nutrient supply was incorporated in the vat at the start so that during the period of propagation the nutrient concentration in the wort was gradually and progressively attenuated. The nutrient concentration was measured on a "Balling" scale; high Balling indicating high concentration, and low Balling low concentration. Attentuation of nutrients during propagation was indicated by gradually lowered Balling of the wort during operation. This attenuation resulted from consumption of the nutrients by the yeast, partly in the making of new yeast and partly in the making of alcohol. The yeast yield and the alcohol yield represented diverse end products. The nutrients consumed in making yeast were not available in making alcohol, and conversely the nutrients consumed in making alcohol were not available in making yeast.

During all of the time yeast was the more valuable product so there was always a profit incentive to discover im-

proved processes whereby a greater percentage of the raw materials could be utilized in making yeast and a lesser percentage in making alcohol without, of course, entailing any sacrifice in the quality of the yeast or entailing any other off-setting loss in efficiency and economy (R. I, 331-32).

(c) During most of this time the art knew that high concentrations of sugar nutrient in the wort tended toward sacrificing yeast yield in favor of greater alcohol yield, but did nothing about it because other factors of cost and efficiency were practically involved; and the commercial yeast manufacturing practice was always to employ worts containing relatively high concentration of sugar at the commencement of the propagation and to allow the nutrient concentration to be progressively attenuated during the period of propagation.

(d) In the light of the above it is most interesting to note the commercial art's efforts toward improvement up to the time of adopting the invention of the first patent in suit. The progress may be tabulated as follows (cf. R. I, 98 *et seq.*):

| Date | Process | Yeast Yield in % of Raw Materials | Alcohol Yield in Gallons Per 100 lbs. Raw Material |
|---|---|---|---|
| To 1911 | O. P. | 12 | 7 |
| 1911-1913 | N. P. | 28 | 2½ |
| 1913-1917 | G. B. | 35 | 2½ |
| 1917-1918 | G. B. M.* | 33 | 2½ |
| 1918-1919 | G. B. | 35 | 2½ |

The raw materials in all of these processes prior to the effective dates of the patents, were grains or mixtures of grains. In other words, the nutrients were all from organic sources, without either inorganic ammonium salts or neutralization of deleterious acidity therefrom.

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* Molasses was used for a short time in the G. B. M. process, but not with much success, and petitioner resumed the G. B. process (cf. *supra*, p. 12).

(e) In 1919 plaintiff changed its manufacturing methods to utilize the invention covered by patent –103. The new process jumped the yeast yield to 65%.

(f) In testing patentability of inventions, at least in an established industry alert toward improvements, the prior commercial art is a most reliable guide not only because it affords the best comparison to judge the quality of the commercial advance effected by the new invention to be judged, but also because it constitutes in itself a realistic appraisal of the prior "paper" art.

It is accordingly worth noting that in all the litigation to date upon the patents in suit, the full novelty of the Hayduck inventions has been recognized so far as concerns prior yeast making practices actually used by the industry.

## The Patents in Suit Cover Novel Combinations

**Patents which claim processes comprising a plurality of steps in prescribed sequence, in prescribed combination and cooperating to a new or better or more economical result should not be invalidated by mere proof that the several steps separately or in different sequence, or in different combination, operating to a different result, were old prior to the inventions of the patentee.**

This Court and others have expressed and accepted the foregoing rule, as follows:

> "A combination is a union of elements, which may be partly old and partly new, or wholly old or wholly new. But whether new or old, the combination is a means—an invention—distinct from them."
>
> *Leeds and Catlin Company* v. *Victor Talking Machine Company*, 213 U. S. 301, 318.

> "Common justice forbids such a defense, as it would work a virtual repeal of so much of the Patent Act as gives to inventors the right to a patent con-

sisting of old elements, where the combination itself is new and produces a new and useful result. New elements in such a patent are not required, and if such a defense were allowed, not one patent of the kind in a thousand of modern date could be held valid. Nor is such a defense consistent with the regulations enacted by Congress in respect to the procedure in litigations in respect to patent-rights."

*Parks* v. *Booth*, 102 U. S. 96, 104.

"The principles of law applicable are elementary and are well stated, with citation of the supporting authorities, in 20 R. C. L. pp. 1125, 1126, as follows:

'A combination is a composition of elements, some of which may be old and others new, or all old or all new. It is, however, the combination that is the invention, and is as much a unit in contemplation of law as a single or noncomposite instrument. The authorities establish the following propositions respecting the patentability of devices or processes of this character: (1) That a combination is patentable if it produces new and useful results, though all its constituents were well known and in common use before it was made, provided the results are a product of the combination, and not a mere aggregate of several results, each the product of one of the combined elements. (2) If it produces a different force, effect, or result in the combined forces or processes from that given by their separate parts, and a new result is given by their union. (3) If it either forms a new machine of distinct character or formation, or produces a result which is not the mere aggregate of separate contributions, but is due to the joint and cooperating action of all the elements. (4) When the several elements of which it is composed produce by their joint action either a new and useful result, or an old result in a cheaper or otherwise more advantageous way'."

*United States Industrial Chemical Co.* v. *Theroz Co.*, 25 F. (2d) 387, 391-2, (4th C.C.A., Cert. Den. 278 U. S. 608).

See also:

*Permutit Co.* v. *Harvey,* 279 Fed. 713, 718-720, (C. C. A. 2).

For convenience of arrangement we shall now treat the three patents in suit seriatim, and, as to each, shall discuss (a) the claims, and (b) the prior art and Record; including comments on the opinions rendered in the Courts in this and the Maryland litigations

## As to Patent –103

### The Disclosure

The claims in suit (1-4 and 7-15 both incl.*) are drawn to processes comprising a particular combination of prescribed steps in a prescribed sequence. They involve factors of chemical composition, control, and time.

Claim 1, for example, of patent –103 recites:

> "The process of manufacturing yeast which comprises preparing a yeast nutrient solution and propagating yeast therein with aeration,
>
> said yeast nutrient solution containing essentially
>
> sugar material
>
> and yeast nourishing inorganic salts from which components are liberated which tend increasingly to acidify the nutrient solution during propagation,
>
> and during the period of propagation neutralizing the deleterious excess of such acidity" (R. II, 3).

It is self evident that the claim does not cover all uses of sugar material and inorganic salts. It does not cover

* All of these excepts Claims 9, 10 and 11 were in suit and held valid and infringed in the first Maryland litigation and in the accounting thereon (8 F. (2d) 186; 38 F. (2d) 314).

complete neutralization of all acids in all processes involving yeast, irrespective of the cause or amount of such acidity, or irrespective of the time or extent of such neutralization.

It covers, rather, the integral coordination of propagating yeast with aeration in a prepared solution containing essentially sugar material and yeast nourishing inorganic salts from which results an increasing acidification tending to become deleterious, and neutralizing the *deleterious excess* of such acidity in the solution while the yeast propagation is being conducted.

Other claims are of graduated scope including further limiting definitions. For example, Claims 2 recites that the neutralizing of the *deleterious excess* acidity shall be "by the addition of an innocuous antacid substance", while Claim 4 still further recites that the latter is "adapted to supply yeast assimilable nitrogen to the yeast". Others of the claims specify that the inorganic salts shall include ammonium sulphate (Claim 9); and that the sugar material shall be molasses (Claims 12, 13, 14). Claim 15 covers the article of manufacture comprising the yeast product made by the defined process.

The patent discloses molasses as "a suitable source of sugar for the yeast production" (R. II, 1, ls. 104-106); ammonium sulfate and phosphate as suitable "inorganic yeast nutrient salts" "in such aggregate quantities and in such proportions as are requisite for supplying * * * the elements for the production of yeast" (R. II, 2, ls. 100-110); calcium carbonate or "other basic or antacid substances such as antacid substances containing or supplying nitrogen can be employed for the neutralization" (R. II, 1, ls. 66-70); and directs one how to calculate the amount of neutralizing agent necessary to neutralize "whatever *detrimental excess* of free acid tends to develop in the nutrient medium during the yeast growth", and when and how it may be added (R. II, 1, ls. 96 *et seq.*; 2, ls. 10-14).

The sufficiency of disclosure of the patent has not been disputed. The superiority of the product, the variety and extent of the savings accompanying the commercial adoption of the process, before pointed out, have likewise not been disputed. There remains then to consider the question of its novelty and patentability over the prior art.

## The Prior "Paper" Art Is Non-Anticipatory

The record (R. I, 44) lists the prior publications and patents first relied on by respondent against patent –103. The trial Court held them all non-anticipatory. The Circuit Court of Appeals below reached the contrary holding on the basis of four items. Of these four, three had already been before the courts in the Maryland litigation and held non-anticipatory. We shall review all four in detail.

### 1. Henneberg Abstract 1908 (R. II, 158)

This report purports to be a summary of a twenty-six page foreign language article originally published by Henneberg in Wochenschrift für Brauerei (1908). The original article and a companion article of 1907 are fully discussed by Judge Soper (8 F. (2d) pp. 191-195), who found them both non-anticipatory and very similar in disclosure.

Henneberg was reporting on scientific data and conclusions with respect to laboratory experiments conducted on a minute test tube scale and under very special conditions. The abstract reports the conclusions but not the data and conveys less information and hence is less relevant than the original.

Henneberg said that:

> "* * * rye or wheat meal, egg albumen, peptone, lecithin and inorganic ammonium salts" * * * are "(1) non-poisonous to yeast in pure *distilled* water, (2) or less poisonous in *distilled* water in presence of sucrose, (3) **Non-poisonous in supply water [that is,**

ordinary water such as is always used in commercial operation], (4) non-poisonous in sucrose solutions, if calcium salts, carbonates or bases are present in small amounts or other salts (such as acid potassium phosphate, magnesium sulphate, sodium sulphide, sodium formate or potassium sulphate) in higher concentrations, and (5) of great nutritive value in presence of the substances mentioned under (4)." (R. II, 158)

These statements relate to both the organic and inorganic nitrogenous materials listed.

Respondent's witness Rautenstrauch was asked on direct examination as to conclusion (4) above (R. I, 174), as follows:

"What is meant by sucrose solution?

A. A solution containing sugar, wherever it comes from, molasses or what it may come from.

Q. 71. Why do you understand that these 'inorganic ammonium salts' are not poisonous in these sugar solutions?

A. It just so happens that in the presence of the sugar, affinity of the yeast for the sugar will make the salts inoperative, whereas if there is no sugar present the salts will have a deleterious effect on the yeast cells."

In the language quoted respondent's expert witness thus explains Henneberg's conclusion (4) as meaning that there is no advantage or utility in the addition of inorganic ammonium salts to yeast nutrient solutions, because such yeast solutions contain sugar, and in the presence of sugar the salts are inoperative. Undoubtedly Henneberg's statements are very unclear, but if they mean what respondent's expert says in the language quoted, then Henneberg utterly failed to foreshadow the invention made by Hayduck years later.

On cross examination the witness Rautenstrauch accepted Henneberg's conclusion (3), namely, that the

nitrogenous substances tested (i.e., both organic and inorganic) are non-poisonous in ordinary supply water (as distinguished from distilled water) (R. I, 213). From this expressed conclusion of Henneberg it would follow that if either inorganic ammonium salts or an organic nitrogen source were added to a yeast nutrient solution in commercial manufacture, it would entail no problem of toxicity because such yeast nutrient solutions are always made up of ordinary supply water (R. I, 511).

Thus, the net result of Henneberg's fourth conclusion as interpreted by respondent's expert, and of his third conclusion, as accepted by respondent's expert, would be that the Henneberg reference pointed away from the Hayduck–103 process because first, the latter provides a "yeast nutrient solution containing essentially sugar material" and second, it uses ordinary water (with of course yeast nourishing inorganic ammonium salts and the step of neutralizing the *deleterious excess* of released inorganic acidity from such salts); whereas the Henneberg article would have taught that inorganic ammonium salts are not poisonous in the solution containing sugar if ordinary water is used.

Petitioner's witness Lamb was asked what the significance of Henneberg's third conclusion would be to a yeast manufacturer, and replied:

> "The inference certainly would be that the nitrogenous substances listed in the preceding paragraph would not be poisonous to yeast in solutions containing sugar in ordinary tap water or commercial water. . . . So whether a yeast manufacturer could draw important conclusions from these experiments with regard to his own operations I very much doubt." (R. I, 403)

The opinion of the Circuit Court of Appeals below makes no mention of the foregoing testimony. It quotes only a later portion of the Henneberg abstract divorced from the context, reading:

> "Under ordinary conditions, these nitrogenous substances form excellent nutrient materials for yeast, their injurious action only appearing in the absence of certain solutions which are more especially compounds capable of neutralizing acids. * * *" (R. II, 158)

In quoting this paragraph the Court apparently did not realize that, as petitioner's witness Lamb pointed out and counsel for respondent agreed (R. I, 512), the only condition under which Henneberg found any of the nitrogenous substances (organic or inorganic) tested by him to be harmful is in distilled water which is not an "ordinary condition", and which condition is of no practical interest whatever in any commercial yeast manufacturing process, because tap water is used.

Suffice it to say, that Henneberg had no conception of the employment of the combination of ammonium salts as a substantial source of inorganic nitrogen together with controlled neutralization of attendant deleterious acidity in a process of yeast manufacture. Indeed, Henneberg's work was all experimental and in the only instance of nutrients where he simulated commercial conditions, namely, *when he used tap water, he omitted any neutralizing or antacid agent and found it unimportant* [see conclusion (3)].

In other words, the Henneberg article would have misled the commercial yeast manufacturer to believe that whether he employed inorganic ammonium salts or an organic nitrogen source no problem of toxicity would be encountered.

Of course Hayduck discovered that such a problem would be encountered and discovered the solution for the problem, and in solving it "went against the combined opinion and teaching of his time" (R. I, 513).

In such circumstances to say that Henneberg's disclosure invalidates the Hayduck patent is like saying that one who says that smallpox is not contagious, has anticipated the discovery of another who finds the con-

ditions of its being contagious and also finds a vaccine to prevent its spread.

Moreover the opinion of the Circuit Court of Appeals below ignores entirely the fact that Henneberg a year later in 1909 wrote a text book (Henneberg's Praktikum), which, as distinguished from his reports on experiments, contained a section for the practical guidance of the commercial yeast manufacturing art. In this connection, as pointed out by petitioner's expert witness Lamb (R. I, 434-34) and by the opinion of Judge Soper (8 F. (2d) p. 196), there is not even a faint or remote suggestion of the use of inorganic ammonium salts with neutralization of deleterious acidity. Cereal material such as malt sprouts were relied on as the source of nitrogen, and the only mention of ammonium phosphate was as an alternative to superphosphate as source of phosphorus.

It is submitted (and Judge Soper found to the same effect, 8 F. (2d) p. 196), that this is the strongest proof that Henneberg's 1908 article reporting on laboratory experiments did not teach even its author (and much less therefore could it teach others) the combination of steps later invented by Hayduck and constituting the claimed process of his patent -103. Seldom does the court in a patent case have before it for appraisal an item of the prior paper art, where its own author himself later shows its sterility as a prior disclosure. It would seem elemental that what Henneberg himself did not read out of his 1908 article cannot in sound law or common sense be judicially read out of it thirty years later.

**2. Pure Products Magazine of 1908 (R. II, 162)**

This is another summary of the same original Henneberg article. It also contains no details and is less informative than the original. Respondent's witness Rautenstrauch concedes that the Pure Products' article is the same as the Henneberg abstract discussed above:

> "A. * * * I should say that the disclosure in the Pure Products article was quite similar to that

which was in the condensed article. They are the same in my opinion." (R. I, 212-213)

The opinion of the Court of Appeals below, speaking of the Pure Products article, says only:

> "This article recognizes the phenomenon of the generation of free acid when yeast is used in brewing and distilling processes* and the fact that such acids may be rendered innocuous by the addition of lime salts." (R. I, 676)

For the reasons pointed out above, the Court's statement is in error if it refers, as apparently intended, to any commercial or commercially useful yeast manufacturing process. The article actually dealt only with the laboratory test tube experiments (above discussed), in distilled water. It gave no hint that in any commercial yeast wort inorganic ammonium salts could be usefully added in substantial amounts to the nutrient solution, and that, if added, they would entail any *excess* or *deleterious acidity* problem, or that if such problem occurred, how to solve it.

Judge Soper pointed out the inadequacy of the Henneberg articles and said that, if Henneberg had known what defendant there (and respondent here) asserted his articles showed, he would have told the world about it when writing his book. Judge Soper also pointed out that the defendant's expert in that case (Dr. Willcox), was Editor of the Pure Products Magazine at the time it published the Henneberg abstract and at the same time had been conducting a school for instructing yeast manufacturers and yet that the Henneberg article failed wholly to teach Dr. Willcox the invention later discovered and patented by Hayduck (8 F. (2d) p. 197).

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* Judge Soper pointed out the difference between a yeast manufacturing process and an alcoholic fermentation such as is here referred to by the Court; and noted that Heneberg's 1908 article said nothing about yeast yields (8 F. (2d) p. 195).

In the present record respondent has offered no testimony which detracts from the soundness of the prior Court's conclusions that the Hayduck patents are valid and pioneer over everything that Henneberg had done or published earlier (*J.* Soper, 8 F. (2d) pp. 191-195); 4th C. C. A. 13 F. (2d) 570; and *J.* Fake, 21 F. Supp. 46).

**3. Wilfert Book of 1890. (R. II, 171)**

This is a translation of three pages from a book in German published in Vienna. The book was not in evidence in the Maryland litigations. It deals exclusively with the *pre-treatment* of a nutrient solution made from grain material. It refers to adding 1% of 5 times diluted sulphuric acid to a grain mash for the purpose of converting the proteins into peptones, and notes that by such addition the mash "contains a rather large amount of sulphuric acid", which "would have a disadvantageous influence on the mother yeast which is now to be added". Accordingly it advises the addition "of so much sweet mash" (not containing acid) held at ordinary temperature that the temperature of the mixture drops to 16° R., and states:

> "In a mash in which the sulphuric acid content is diluted to that extent, the development of the yeast and the fermentation proceed in a perfectly normal way, and there is no reason to be found for removing the sulphuric acid from the liquor." (R. II, 173)

However, if the removal of the acid is desired, Wilfert says:

> "This can be done in a very simple way by adding to the mash slaked lime * * *. The lime combines with the sulphuric acid to form calcium sulphate or sypsum, which compound is only slightly soluble in water and accordingly separates from the liquid in the form of a white powder. After the addition of the lime the liquid must be left undisturbed until the lime has settled out at the bottom, after which

the liquor standing above the sediment is carefully drawn off" (*id.*).

Finally, the excerpt concludes:

> "As one can convince himself by a comparative test with two lots of the same mash, one of which was neutralized with lime whereas the other was left in the original state, the neutralization has not the slightest influence on the amount of newly-produced yeast nor its fermenting power and for these reasons the neutralization can be omitted entirely." (R. II, 174)

So far as its scientific relevance is concerned, the Wilfert excerpt teaches no more than that sulphuric acid can be used in the clarification and peptonizing pre-treatment of grain mashes, and that such mashes may then by dilution or by pre-neutralization be prepared for subsequent employment in yeast manufacture. Wilfert states that between the two methods of pre-treatment there is not the slightest difference in quantity of subsequent yeast yield.

It is difficult to imagine a more tenuous and specious basis for argument than Wilfert affords to support the defense of anticipatory disclosure against patent –103. This excerpt deals only with preparatory operations and not with yeast propagation and makes no disclosure whatever of the use of nitrogen from inorganic ammonium salts that would release deleterious acid, and likewise no disclosure of the use of aqua ammonia or other antacid to combat such deleterious acidity in yeast manufacture.

Wilfert's whole book was in the art for a quarter of a century before Hayduck's invention, and during that period no one ever gleaned from it either the factor of adding inorganic ammonium salts to a yeast nutrient solution, or the factor of neutralizing the deleterious excess of released inorganic acid during the period of yeast propagation, or the combination of these two things which constitutes the integral process of patent –103.

**4. Pollak Swiss Patent of 1913 (R. II, 151)**

The Circuit Court of Appeals below states:

> "It is true * * * that Pollak's process is to be employed with the end result of increasing the acid, increasing the yield of the yeast thereby, but the fact remains that Pollak did disclose a method of control of acidity by neutralizing acids by means of the 'ammonia compounds' e.g. ammonia or strongly alkaline ammonium compounds." (R. I, 678-79)

The only mention of acids and neutralization by this Pollak patent (like Wilfert) deals with pre-treatment of a wort *before* it is to be used in the yeast propagating process. Respondent's witness Rautenstrauch agreed with this:

> "Referring to the Pollack reference, that shows a *pre-treatment* of the mash materials by lactic fermentation." (R. I, 211)

Petitioner's witness Lamb likewise said:

> "It describes the preparation of one of the raw materials that is to be utilized in the manufacture of yeast *at a later stage.*" (R. I, 401)

The two witnesses agreed that Pollak's procedure was for the production of an increased amount of lactic acid in the souring mash (i.e., during the preparation as distinguished from the utilization of the nutrient solution). Lactic acid is an organic acid, and in any concentration ordinarily encountered is not deleterious to yeast propagation, being distinguished in both those respects from the deleterious acid involved in the Hayduck process. Pollak's object was to neutralize lactic acid created in the souring pre-treatment to convert it into ammonium lactate (an *organic* ammonium salt), which was assimilable as a yeast food. Pollak did not disclose the use of a nutrient solution including substantial amounts of assimilable nitrogen from *inorganic* ammonium salts which would

release harmful acid during yeast manufacture. Therefore, he did not have Hayduck's problem. He did not disclose the use of aqua ammonia or other antacid during yeast propagation to combat any acidity problem.

The most that Pollak may be said to disclose is a repetition of the very old scientific knowledge that acids may be neutralized, and his new discovery that lactic acid souring in the *pre-treatment* of a mash can be carried to greater lengths if a portion of that lactic acid is periodically converted into ammonium lactate. The former item of scientific knowledge was probably centuries old. It was a "natural law" discovered in the infancy of chemistry. The later item of knowledge was Pollak's new application of that natural law, but is utterly different from the application of that law in the process of patent –103. The Circuit Court of Appeals below refers only to Pollak's disclosure of the natural law. It does not find anything in Pollak which even hints at the employment of *inorganic* ammonium salts as yeast nutrients, nor of the neutralization of released *inorganic acid* from such salts *during yeast propagation*, which two factors in combination comprise the Hayduck process.

Pollak's object was practically the antithesis of Hayduck's. Pollak sought to make more sugar into an organic acid to form larger amounts of the organic ammonium salt, all *prior* to yeast propagation—Hayduck used the sugar plus inorganic ammonium salts to make yeast, and neutralized the deleterious excess of resulting acidity released *during* the propagation. Pollak's technical irrelevance is concisely stated by petitioner's witness Lamb (R. I, 400).

### 5. The Same Art Contrasted by Patent –103 Specification

Portions of the Hayduck specification contrast the state of prior knowledge with the subject of his newly-invented process.

It is the undisputed fact that in these portions of the –103 patent, quoted by the Circuit Court of Appeals below

(R. I, 673-675), and relied on by it as anticipating the patent, the patentee correctly contrasts such prior disclosures as Henneberg and Pollak with his own invention. This fact is of significance (1) because it is confirmatory of the differences, and the importance of the differences, between such prior art and the Hayduck process, and (2) because it proves that patent -103 was allowed by the Examiners in the Patent Office in the face of the same prior knowledge now presented in defense to its validity. The law is well settled that in such circumstances the presumption of validity is strengthened and the burden of proof on the defendant is accordingly increased.

The situation was concisely summarized by the Circuit Court of Appeals for the Fourth Circuit as follows:

> "In the opinion below, 8 F. (2d) 186, will be found a full, fair, and painstaking review of the evidence and of the contentions of the respective parties. It need not be here repeated. We have given careful examination to the record, and have considered the elaborate arguments, oral and printed, which have been submitted to us, and are satisfied the court below was right in holding the Hayduck patent valid. Henneberg and perhaps others of the earlier workers in the field may have come near the discovery described by Hayduck, but none of them made it. Some of them were among the most highly skilled of the world's experts in the yeast-making art. They were in immediate and almost daily touch with the practical men of the industry, as well as with those who controlled the capital employed in it. They were on the outlook for every possible improvement in its methods. If they had known of the Hayduck process, they would have made prompt use of it." (13 F. (2d) pp. 570-571)

## The Specific Errors of Fact in the Opinion Below as to the Prior "Paper" Art

(a) The opinion (below) at R. I, 680, states:

> "* * * there is nothing new, nor is it claimed that there is anything new or patentable in the use of

sugar or in the use of molasses with inorganic salts, such as ammonium sulphate to create nutrient solutions for the manufacture of yeast."

The Court below failed to comprehend that merely this by itself was not even useful. It is true that others had proposed using such salts, but it is also true that such proposals had always been commercially rejected because: on the one hand, if they were added in potentially beneficial amounts, the addition *ipso facto* would cause a toxic condition to arise; and on the other hand, if such additions were made in amounts limited to avoid such development, the addition was not enough to be significantly beneficial.

It is easily understandable that the practical art refrained from entering either cul de sac.

The witness Lamb testified:

"Can you tell us whether it was known before Hayduck that inorganic ammonium salts could be used for yeast salts?

A. Ammonium salts had been used as an ingredient in culture experiments in which minute specimens of yeast were grown for scientific purposes and also in the initial stages in the preparation of seed yeast. I don't know of any extensive use of inorganic ammonium salts.

XQ. 806. Had that been proposed for use as yeast nutrients in yeast manufacture?

A. Not in significant amounts." (R. I, 509-10)

(b) The opinion below continues:

"The element of invention claimed by Hayduck consists in the production of unusually large yields of yeast by the use of a neutralizer for the acid components during the period of the propagation of the yeast." (R. I, 680)

This statement is also incomplete and thereby erroneous. The element of invention claimed by patent -103 is in the

combination of (a) adding inorganic ammonium salts to normal sugar worts in large enough amounts to be of greatly significant potential benefit, and (b) adding during propagation an antacid to offset the *deleterious excess* of released inorganic acid which would otherwise create toxicity. In other words, Hayduck added amounts of great *potential* benefit and added something else (i.e., controlled amounts of antacid) to make that full potential benefit an *actual* benefit. Neither factor had any utility without the other. They had never before been used in combination, and Hayduck's invention combining them resulted in what Judge Biggs below calls "unusually large yields of yeast" and what Judge Soper calls "revolutionizing the art".

(c) The opinion below concludes:

> "At the most, in the patent *sub judice* Hayduck has applied the prior art to the propagation of yeast when acidity was deleterious and unwanted. At the least, he has not done as much as this since Wilfert disclosed the principle upon which Hayduck rests his disclosure in respect to the propagation of yeast." (R. I, 680)

We submit that the Court below again erred. At both the most and the least, Hayduck originated a process comprising a new combination of (a) adding inorganic ammonium salts in amounts of great potential benefit, and (b) adding antacid to neutralize the deleterious excess of released inorganic acid to make the potential benefit an actual one. Henneberg did not disclose that invention. On the contrary, Henneberg stated that in the only wort which would be used commercially (made with ordinary water) no such acidity problem would arise. He was wrong, but no one knew he was wrong until Hayduck discovered that the problem did arise and invented his process which deliberately encountered and controlled it. Henneberg's later practical text book proves that the same author's 1908 experimental report did not teach even Henneberg what

the Court below now holds it should have made obvious to everyone else!

As for Wilfert, the only "principle" disclosed is that in the *preparatory* clarification treatment of a wort by sulphuric acid, later dilution or later fixation and careful removal of the acid radicals was desirable *prior* to adding seed yeast. Wilfert says:

> "As one can convince himself by a comparative test with two lots of the same mash, one of which was neutralized with lime whereas the other was left in the original state, *the neutralization has not the slightest influence on the amount of newly-produced yeast* nor its fermenting power, and for these reasons the neutralization can be omitted entirely." (R. II, 174)

Contrasting this with Hayduck's discovery that the yeast yield could be *doubled*, how can it fairly be said that the principle used by Wilfert was the same as the principle used by Hayduck? Wilfert added no inorganic ammonium salts. In the instance where he formed calcium sulphate *in situ*, he was careful physically to remove it. During propagation there was no release of inorganic acidity nor neutralization of the deleterious excess thereof.

In the face of Wilfert's quoted statement, it would seem to do violence to common sense and to sound law to hold such a reference to invalidate Hayduck's patent which showed twenty-six years later how—by using different materials and exercising different control at a different time—the commercial art could be revolutionized. Certainly such a holding is hardly consonant with the principle of the patent statutes to reward one who "promotes the progress of the useful arts".

We submit that the novelty of the Hayduck process is established. None of the references referred to by Judge Biggs contains any disclosure of the integral process covered by patent –103.

## The Specific Errors of Law in the Definition of Patentability Adopted in the Opinion Below

The adverse conclusions as to validity in the opinion below may be explainable on misapprehensions of the law, and we believe the opinion clearly indicates that such was indeed the case.

The Court states:

> "We think that the test of invention to be applied to the patent *sub judice* may be summed up as follows: patentable invention under the circumstances of the case at bar must consist of two elements; first, the inventor must discover the working of a natural law; second, he must put that natural law to effective use. * * * Both elements, however, must be present to constitute patentable invention." (R. I, 674)

We are aware of no prior reported decision which enunciates such a rule of law in a patent case. The harshness of the rule, as may be immediately appreciated, would deny patentability to nearly every achievement of human endeavor. Ohm, Volta and Faraday would have practically foreclosed the field of electricity from the range of subsequent patentable invention. After Newton, no one could have validly patented a process newly applying the law of gravity, and yet this Court found the contrary in its well stated and much cited opinion, *Eibel Process Company* v. *Minnesota & Ontario Paper Co.*, 261 U. S. 45, where the gist of the invention was merely increasing the pitch of the screen of a Fourdrinier machine to give the stock the added force of the down hill flow, i.e., to allow gravity to speed the flow of the paper pulp.

Nor can Judge Biggs' statement below be supported by attenuating it. He says:

> "In the case at bar Hayduck cannot claim and does not claim to be the discoverer of the fact that the growth of the yeast may be stimulated by neutralizing

> the acid by an antacid. The operation of this natural law in respect to yeast was discovered by others before him * * *." (R. I, 674).

The fact is Hayduck *did* discover that the yield of yeast could be greatly increased not "by neutralizing the acid (Query: To what acid does the Court refer?) by an antacid"; but by an integrated combination of the steps (a) adding amounts of inorganic salts of great *potential* benefit, and (b) adding an antacid during propagation to neutralize the *deleterious excess* of the released inorganic acid to make the benefit *actual*.

Either step without the other was fruitless. The two in combination were revolutionary. His discovery of the combination process entailed also his discovery of the results which flowed from the combination of natural laws operative in his process—a combination of laws not operative collectively in any process of the prior art. He did discover a new combination of natural laws.

But Hayduck does not claim a law of nature, and indeed it is elementary that a mere law of nature is not within the scope of patentable subject matter (see, Walker on Patents, Dellers Edition, Vol. I, p. 62 *et seq.*). Hayduck does not claim mere results. Others remain entirely free to achieve the same or greater results. What patent -103 does claim and what was new and validly patentable is the combination of specified steps, in specified sequence and with certain specified mediums,—these comprise his defined process. Neither Henneberg, Wilfert, or Pollak, nor any other reference, ever taught that combination.

It is submitted that the above recited errors of fact and of law in the decision of the Court of Appeals for the Third Circuit make abundantly clear the error of its conclusion.

The history of the art before and since Hayduck's invention effectually disproves "obviousness" at the time he made it. The invention fully meets the standards of

patentability announced by this Court and is not met by the prior art. As Judge Soper said:

> "If the foreign patents and the Henneberg articles cited against the patent are compared with its disclosures, it will be seen that, so far as the step of neutralization in the manufacture of bakers' yeast is concerned, the former are vague and indefinite, while the latter makes specific and clear statements that the employment of alkaline substances are of great advantage in the quantity and quality of the product. It is one thing to show that, when yeast is used in fermentation processes, its fermentative power and duration of life will be enhanced by offsetting deleterious acidity or that in producing pure yeast cultures in the laboratory with distilled water, antacid substances should be used, and it is quite another to demonstrate that, when the end in view is the production of large quantities of yeast for its own sake, neutralizers may be advantageously employed. **As has so often been said in patent cases, it is the last step which counts.** Loom Co. *v.* Higgins, 105 U. S. 580, 26 L. Ed. 1177; Barbed Wire patent, 143 U. S. 275, 12 S. Ct. 443, 36 L. Ed. 154; Badische Anilin & Soda Fabrik *v.* Kalle (C.C.) 94 F. 163, affirmed in 104 F. 802, 44 C.C.A. 201; Permutit Co. *v.* Harvey (C.C.A.) 279 F. 713; Seymour *v.* Osborne, 11 Wall. 516, 20 L. Ed. 33; Loew *v.* German-American Filter Co., 164 F. 855, 90 C.C.A. 637." (8 F. (2d) pp. 197-198)

## As to Patent –105

### The Disclosure

The claims of this patent* (all of which are in suit) are drawn to new combinations of prescribed steps of manipulative control of nutrient solutions to effect improved yields of yeast, without the production of alcohol.

* Claims 4, 8. 9, and 10 were held valid in the second Maryland litigation, but the Court did not pass on the validity of the other claims (38 F. (2d) p. 338).

Claim 10 reads:

"A process of propagating yeast with a relatively low yield of alcohol which comprises,

preparing a wort containing all essential yeast nutrients in solution,

initiating propagation of yeast in a highly diluted portion of said wort,

aerating the diluted portion, and substantially continuously adding during the period of propagation,

the wort of higher concentration at a rate such that the concentration of the dilute wort remains substantially constant, whereby substantially all of the alcohol which may be formed is assimilated." (R. II, 7)

Judge Soper's opinion in the second Maryland suit describes the subject matter and its advantages as follows:

"The important feature of the process disclosed by this patent relates to the method in which the mash or wort is introduced into the propagating vat. A feeding process, referred to in the testimony as the Zulauf feed, is prescribed, whereby a comparatively small part of the nutrient solution is diluted, placed in the vat and seeded with yeast, and, after it has begun to grow and propagate, the remainder of the wort is fed in gradually to supply its increasing needs. As we shall see, this change has been accompanied by a great increase in the yield of yeast from raw material in the modern yeast factory."

* * * * * *

"The patentee states that by this method the yeast is constantly given new supplies of all nutriment necessary for its propagation, and there is always a wort concentration by means of which the nutriment is absorbed most efficaciously and quickly by the yeast. In other words, there is offered the advantage of great dilution, while the concentration of the wort calculated for the entire quantity remains the same. The advantage of this procedure is contrasted

with that customarily used in the manufacture of yeast, for therein propagation begins in a relatively concentrated solution and the concentration is decreased gradually during propagation." (38 F. (2d) 329, 331)

The opinion of the Circuit Court of Appeals below similarly states:

> "The patent contemplates the management of the process in such a wise that the nutrient solution will be kept at such a relatively low concentration that the amount of alcohol produced will never go beyond that which the feeding yeast can absorb. . . . The gist of the patent therefore is for a rate of feeding the wort into the nutrient solution already in the fermenting vat." (R. I, 681)

Reverting to the history of commercial yeast manufacture (*supra*, pp. 11-13), it will be remembered that all of the processes in use prior to petitioner's adoption of the –105 method in 1923 were alike in the respect that they were "straight-set", that is, the entire nutrient solution, i.e., the entire wort, was placed in the propagating vat at the start, and during the period of propagation the concentration of the nutrients gradually and progressively decreased.

As contrasted from all these "straight-set" methods, the patent –105 process divides the nutrient solution of relatively high Balling (i.e., concentration) into two portions of which only one is diluted to about 1° Balling and put into the propagating vat at the start. The other or reserve part of the solution is then added slowly and substantially continuously during propagation at a rate such that the concentration of the nutrients in the vat, instead of continuously decreasing, is maintained substantially constant. In other words the food for the yeast is continuously replenished as it is consumed.

The proper division of the initial thick solution into two discrete portions may be calculated by a rule which

the patent specification sets forth on page 1, lines 90 to 95 (R. II, 5), and of which it is sufficient here to say that the fractional division depends upon the Balling of the thick wort selected by the manufacturer and on the Balling (of the diluted part) at which the manufacturer wishes the propagation to begin. After the division is made and the minor portion in the propagating vat is adequately diluted, the patent directs:

> "Thereupon the remainder of the concentrated wort is added slowly and substantially continuously throughout a protracted period of time and at a rate such that not only the alcohol which may have been formed from the quantity of sugar present in the diluted portion of the wort, but also any alcohol which may be formed from the sugar which is present in the added wort, can be assimilated immediately by the yeast." (R. II, 5, ls. 74-84)

As Claim 10 of the patent points out, the reserve wort of higher concentration is substantially continuously added during the period of propagation

> "at a rate such that the concentration of the dilute wort remains substantially constant".

That means, if 1° Balling is selected for the initial dilution or concentration of wort in the vat, the remaining higher Balling wort (or the reserve) is fed in at such a rate that the nutrient added substantially equals the nutrient being consumed by the yeast and consequently the nutrient concentration in the vat remains substantially constant at 1°.

The patent further states:

> "* * * the process described above offers the advantage that the yeast is constantly given new supplies of all nutrient constituents necessary for its propagation by the continuous addition of concentrated wort, and that thereby as a result of the continual consumption of the nutrients by the yeast there is always a wort concentration, by means of which the nutrients and the resultant substances are

absorbed most efficaciously and quickly by the yeast * * *." (R. II, 5, ls. 98 *et seq.*)

The patent is directed particularly to this procedural or manipulative, rather than chemical, aspect of the operation; i.e., a division of the wort into two parts with propagation begun in a diluted fraction and the gradual feeding in of the concentrated reserve as stated. By adopting this perfected process, the yield of yeast was still further increased and there were also other accompanying advantages in shortened time from commencement of the yeast propagation to the harvesting of the yeast crop and in enhanced quantity of output from a given sized apparatus. Up to the date of trial petitioner had made over one billion seven hundred million pounds of yeast, using the Zulauf process generically covered by patent -105.

**The Prior "Paper" Art Is Non-Anticipatory**

The defense in the second Maryland suit and the defense in the present case both rested on arguments that before Hayduck it was known that the propagation of yeast was favored and the production of alcohol disfavored by conducting operations in a wort with a low sugar concentration, and that this item of knowledge taken in connection with the German patent to Rainer 10,135 (R. II, 135), deprived Hayduck's invention of any patentable novelty.

The District Court below did not refer to the prior art, resting its conclusion on a different ground. The opinion of the Circuit Court of Appeals below indicates that while it accepted the argument it was not certain of its position because it admitted that "the process described by Hayduck may constitute a mechanical improvement over the prior art" and continued "But even if the process disclosed by Hayduck be held to constitute invention, the patent is invalid for indefiniteness" as was held by the District Court (R. I, 683).

Judge Soper, in the second Maryland litigation, discussed the prior art at length (38 F. (2d) pp. 331-335), and clearly pointed out the reasons why the validity of patent –105 is unshaken by it.

**1. Iwanowski Abstract (1903)**

This abstract of another article in German (R. II, 157), is an example of the above mentioned prior art knowledge of the isolated fact that there is a tendency toward increased alcohol production in the presence of increased sugar concentration and obtainment of low alcohol yields in the case of lower sugar concentration (R. I, 215).

The abstract deals only with observations on operations of the "straight set" type, namely, where all of the nutrient solution is put into the fermenter at the beginning. This "straight set" type of process was uniformly employed in the industry for many years prior to Iwanowski (R. I, 216-217) and it was not until Hayduck's inventions of patents –105 and –106 that the yeast manufacturing art knew any method by which the abstruse knowledge of the Iwanowski article could be turned to practical advantage; until Hayduck high dilution of nutrient solution unavoidably entailed overbalancing disadvantages and expense.

Iwanowski was cited but not relied on in the second Maryland litigation. It shows no division of the wort into a minor diluted portion, and no addition of a concentrated reserve; it merely repeats the old knowledge that a high dilution tended toward lesser alcohol production. It shows nothing more than the statement at lines 23 to 32, page 1 of patent –105 (R. II, 5) and it is worthy of note that the Examiners in the Patent Office found the claims in suit allowable thereover. Judge Soper also held the patent valid over this prior art knowledge (38 F. (2d) p. 331) and even the Circuit Court of Appeals below did not hold that this isolated item of knowledge was of itself anticipatory of Hayduck's process.

### 2. Rainer German Patent of 1879

The subject matter of the Rainer patent is also referred to and disclaimed in the specification of patent –105 (R. II, 5; ls. 32-53); and the patent claims were allowed thereover.

In this patent, raw materials as cereals, corn, legumes, bran, malt sprouts, spent grains, gluten, etc. are employed as the chief source of "peptones"; and molasses or sugar is employed as the sugar source. Separate solutions of these ingredients are made. The wort in which propagation is to be begun is a mixture of the two in which the sugar is "always limited to no more than ½ to 1% of the weight of the total liquor", while the "peptone content of the mass may amount to 1 to 2% of the weight thereof". (R. II, 139). That is to say, the wort in which propagation is begun is diluted so that the sugar concentration disfavors alcohol production, and the peptone concentration is twice the sugar concentration.

Thereafter at about three hour intervals or when the "sugar has been consumed entirely or at least the greatest part thereof for the growth of the yeast, an additional portion containing from 1/20 to 1/10% is added and, likewise the peptones after having been consumed, can be added again to the liquor, * * *." (R. II, 139)

Rainer conducts his process so that the ratio of peptone to sugar in the wort in the propagating tank is 2 to 1 *at the start* of operations, and so that the peptone to sugar ratio over the operation as a whole is also 2 to 1. He points out also at the end of his specification that the yeast actually consumes peptone and sugar in the ratio of 1 to 2:

> "According to results obtained up to the present, from 250 to 300 kg of a pure and vigorous pressed yeast can be obtained from every 100 kg of pure peptone (dry weight), only about 200 kg of dextrose or sugar being required for its cultivation." (R. II, 140)

Judge Soper states:

> "This seeming contradiction in the ratio between the substances actually consumed and that existing during the growth of the yeast is due to the fact, as the experts agree, that all of the peptone in the material is not assimilable by the yeast, and that consequently the sugar is consumed faster than the peptone." (38 F. (2d) 329, 333-4)

Both Judge Soper and Judge Biggs (below), found that Rainer disclosed adding the peptones continuously and the sugar at intervals (38 F. (2d) p. 335; R. I, 682).

As a result of Rainer's suggested procedure the nutrient content and composition and the Balling thereof in his propagating tank fluctuate and are not maintained constant, and as Judge Soper pointed out:

> "* * * Rainer had no clear perception of the advantages to be derived from a continuous feed and a substantial constancy of material constituents of the wort, * * *" (38 F. (2d) p. 335)

as disclosed by Hayduck.

In the Baltimore case there was evidence that following Rainer's preferred process the yeast yield would be only 5% on the basis of the raw materials. Judge Soper held:

> "This testimony was disputed, but, without discussing the matter in detail, it is sufficient to say that the evidence that the yield would be unsatisfactory commercially is convincing." (38 F. (2d) p. 338)

In the present case, respondent's witness Free testified as to conducting *ex parte* what he alleged was a duplication of the Rainer process. It appeared that he employed peptones from malt sprouts and sugar from molasses. It appeared under cross examination that he incorporated important departures from the Rainer process; but, he alleged his yeast yield on the basis of peptone and molasses was 53% (R. I, 296). The true basis of calculation should have been with respect to the cereal materials and

the molasses as respondent's expert admitted. These cereal materials from which Rainer makes his peptone must be considered in arriving at the cost of Rainer's raw materials.

Now, the witness admitted that his peptone extract represented only about one-third of the malt sprouts.

> "XQ. 179. Well, have you any data from which you can give us the figure of the amount of peptone you obtained from the raw material sprouts?
> A. Well, that is one-third." (R. I, 294)

It thus appears that the witness obtained a yield on the true basis of raw materials of only 20%. This is arrived at as follows: Since Rainer says the yeast crop consumes peptone and sugar in the ratio of 1 to 2, whereas these materials are supplied in the wort in the ratio of 2 to 1, it means that three-quarters of the peptone is not assimilated. For the purposes of the wort, therefore, assuming 100 units of sugar there is necessary to supply 200 units of peptone, or 300 units combined, and since the witness Free said he obtained a yield of 53% on such materials, that means that his yeast yield would have been 159 units. Since, however, to get the 200 units of peptone required 600 units of malt sprouts, his true starting materials were 600 units of malt sprouts, plus 100 units of sugar, a total of 700 units, and on this basis the 159 units of yeast crop gave a yield of about 20%.

Respondent's experiments thus confirm Judge Soper's above quoted holding as to Rainer, that "the yield would be unsatisfactory commercially". If further confirmation of this fact be needed it is to be found in the book published in 1912 by the well recognized authority Kiby entitled "Handbook of Pressed Yeast Manufacture" which states:

> "Dr. Rainer in Vienna obtained in 1879 a patent for the manufacture of compressed yeast without the production of alcohol; much peptone and a little sugar were brought to fermentation; nevertheless **the process did not come to a successful realization.**

**All the large scale experiments to that end were uniformly unsuccessful."** (R. I, 441)

Comparing even respondent's test results with the summarized history of the commercial processes in use in the United States (*supra*, pp. 11-13), it would appear that the Rainer process would have been a step backword from the results obtained commercially even as early as 1911, and would have given little more than half of the yields obtained in 1913. It would be only one-quarter of the yield obtained by the process under Hayduck's patents –105 and –106.

In the face of this difference between a step backward and a step forward, we contrast the conclusion of the Circuit Court of Appeals below:

> "We are convinced, however, that there is little difference in substance between beginning fermentation with a wort at 1° Balling and adding nutrient solution at 12° Balling from time to time to prevent the excess production of alcohol as taught by Hayduck and beginning the fermentative processes with such a low concentration of sugar in the nutrient solution that the feeding yeast will not produce excessive alcohol as taught by Rainer * * *." (R. I, 682).

with the opinion of Judge Soper:

> "The regulation of the rate of addition so that the yeast may propagate and substantially all the alcohol formed may be assimilated, and the maintenance of substantial constancy of concentration of nutriment, through regulation of the rate of addition, are not found in any reference in combination with the other elements expressed in these (Hayduck –105) claims.
>
> * * * * * * *
>
> Certainly a skilled worker, with the Rainer patent before him, together with the statement of its impracticability,* would not be justified in concluding

* Judge Soper was here referring to the statement in Kiby's book quoted above.

that the disclosure of the patent was of much practical value. On the contrary, he would be led to search for the defects in the process so as to take the last step in order to transform failure into success. As the evidence indicates that Hayduck has rendered this service, the patentability of his disclosure is established," (68 F. (2d) pp. 337-338) (Parenthetical insert ours).

No witness for respondent ventured to testify that Claim 10, for example, of patent –105 was anticipated by anything disclosed in the Rainer patent; nor has respondent yet advanced that assertion. We have then a conceded difference and a conceded measure, in practical results, of the difference. We have the fact that for an interval of thirty-seven years the disclosure of the Rainer patent did not make obvious the process of patent –105. We submit that Hayduck's improvement required the exercise of patentable invention and that the patent is valid over the prior art.

**The Patent Is Not Indefinite**

As pointed out *supra*, the Circuit Court of Appeals below was not convinced of the logic of its decisions, and therefore added:

"But even if the process disclosed by Hayduck be held to constitute invention, the patent is invalid for indefiniteness as was held by the learned District Judge. Both the times and manner in which the concentrated nutrient solution is to be added may be ascertained as we have stated solely by experimentation. * * *

It is settled that if the disclosure of a patent is so indefinite as to require independent experiments, the patent is void." (R. I, 683)

The Court here refers to the adequacy of disclosure regarding the rate of addition of the concentrated reserve wort into the diluted fraction of the wort in the propagating tank during propagation. The facts are as follows:

Hayduck -105 makes a complete concentrated nutrient solution of relatively high Balling, a 12° Balling solution being referred to in the example (R. II, 5, l. 67); obviously the concentration of the reserve might be made 5° or 25° Balling, as the individual manufacturer might prefer. The patent then takes a predeterminable fraction of this relatively concentrated solution and dilutes it in the propagating tank to a relatively thin solution, the example refers to 1° Balling (R. II, 5, ls. 70-72); obviously it might be ¾° Balling or 1½° Balling, as the individual manufacturer might prefer. As admitted by respondent's expert (R. I, 575, Q. 528), if the propagation is begun with a relatively small amount of seed yeast, the rate at which the nutrients would be consumed will be slower than the rate of consumption if a relatively large amount of seed yeast is employed. It thus is manifest that the rate of feeding the more concentrated solution will vary in accordance with the selected concentration of nutrients in the reserve wort and in the diluted wort and will also vary in accordance with the amount of seed yeast present at the beginning of the propagation. The rate of feed quantitatively in gallons per hour will vary, therefore, dependent on the particular starting conditions chosen. The *relative rate of feed*, however, in all cases remains fixed, namely, that the reserve shall be substantially continuously added so that the concentration of nutrients in the dilute portion shall remain substantially constant; in other words fresh nutrients shall be added at substantially the same rate that nutrients are consumed by the yeast.

The Circuit Court of Appeals below, therefore, falls into plain error of fact in holding that "the times" in which the concentrated nutrient solution is to be added may be ascertained solely by experimentation. On the contrary, the Hayduck patent explicitly states that the concentrated reserve shall be added "substantially continuously" (R. II, 5, ls. 75-76).

The Court below erred likewise in holding that the "manner" of addition must be determined solely by experimentation. The patent states that the reserve shall be fed "slowly" and "at a rate such that the concentration of the dilute wort remains substantially constant" (Claim 10).

If the Balling of the diluted portion in the tank where propagation is occurring is at 1°, this means that the reserve shall be fed in so that the nutrient concentration in the tank remains substantially constant at 1°. That in turn means that the operator, who is conducting the process, has merely to watch the Balling of the solution in the propagating tank and if the concentration begins to decrease below 1° he increases the rate of reserve feed to raise it again to 1°, and conversely if the concentration in the tank tends to increase over 1°, he reduces the rate of the feed so that the concentration is restored to 1°.

This contracts the inquiry to, how may the operator ascertain the degree Balling? The evidence is uncontradicted on this. Petitioner's witnesses Lamb (R. I, 458) and Field (R. I, 388), and respondent's witnesses Rautenstrauch (R. I, 206) and Free (R. I, 270), all agree that the art had a simple instrument of measurement, namely, a saccharimeter, the use of which to determine concentration was a normal thing. This is merely a float with graduations marked in degrees Balling, and the depth at which the instrument floats in the wort can be read directly to indicate density of the wort. If the density of the wort is high, the float will not sink so far down in it as if the density is low (R. I, 394). Such a routine observation is not an "experiment", it is a normal control test.

An analogy might be found in an instruction to let a liquid flow from a faucet into a leaky pail at a rate such that the level of the liquid in the pail would remain constant. Obviously the size of the holes in the pail might vary, the rate of leakage might vary and the den-

sity of the liquid might vary, so no quantity rule in gallons per unit of time could be set forth; but it would be within easy comprehension of the most unskilled when so directed, merely to watch the liquid level in the pail and open the faucet further if the level tended to drop or shut it some if the level tended to rise.

Another analogy would be to give instruction to a furnace tender to maintain a constant steam pressure in a boiler. He would then have merely to observe the steam gauge and, if it dropped, open the draft and add more coal, whereas if it rose, he would close the draft and not replenish the fuel so rapidly. The exact number of pounds of coal fed would depend on the furnace size, the kind of coal, the size of the fire in the furnace, the draft used, etc., but the direction to keep the steam pressure constant would be sufficient direction for a skilled furnace operator.

The saccharimeter being a common tool in the yeast manufacturing art, the only question before the Court on the issue of sufficiency of disclosure is whether an instruction to maintain a density gauge condition substantially constant is an instruction that requires "independent experiments and investigations", which render the patent ambiguous and inoperative; or is one that can be followed by the ordinary skilled worker in the art and makes the disclosure sufficient. The normal use of such an instrument cannot properly be called experimentation. Respondent's witness Rautenstrauch admitted that during the period of propagation the amount of yeast increases, and that the patent: "teaches one skilled in the art to feed in (the reserve nutrient solution) at an increasing rate in accordance with the food requirements of the yeast as it multiplies (R. I, 238). To do this and thus keep the density substantially constant does not involve experimentation.

We believe the question answers itself. If as the Court below held, the instruction is so ambiguous as to render the patent invalid, the alternative in the patent would have been to write an encyclopedic specification in which quanti-

tative amounts in terms of gallons per hour should have been recited for all the infinite permutations of reserve and dilute Ballings, types of nutrients, and amounts of seed yeast possible. This is not required of a patentee:

> "The law requires every inventor, before he can receive a patent, to furnish a specification or a written description of his invention or discovery, and of the manner and process of making, constructing, using and compounding the same, in such full, clear, and exact terms, avoiding unnecessary prolixity, as to enable any person skilled in the art or science to which it appertains, or with which it is most nearly connected, to make, construct, compound, and use the same. The specification, then, is to be addressed to those skilled in the art, and is to be comprehensible by them. It may be sufficient, though the unskilled may not be able to gather from it how to use the invention. And it is evident that the definiteness of a specification must vary with the nature of its subject. Addressed as it is to those skilled in the art, it may leave something to their skill in applying the invention, but it should not mislead them."

*Mowry* v. *Whitney*, 81 U. S. 620, 644.

See also:

*Eibel Process Company* v. *Minnesota & Ontario Paper Co.* p. 66; *supra*, p. 11.

The conclusion of the Circuit Court of Appeals below rests on a statement of fact which is plainly erroneous, and rests likewise on a misapprehension of the law. The patent sets forth a fully operative disclosure and is not invalidated by the prior art.

## As to Patent –106

The facts and issues with respect to this patent can be most briefly stated.

### The Process Disclosed and Its Utility

It is here stipulated (R. I, 38) and the Courts both in Maryland and in the Third Circuit have held, that this patent* comprises the features of patent –103 and the features of patent –105 combined into a single integrated process (38 F. (2d) p. 342; R. I, 683).

This integrated process obviously combines all of the advantages of the processes disclosed in patents –103 and –105 and it was by this "last word" process that the most of the one billion seven hundred million pounds of yeast were made by petitioner up to the date of trial (i.e. petitioner's D.M. process, described by its witness Luce, R. I, 105).

The utility of the patented process is also shown by the fact that the defendant in the second Maryland litigation appropriated it in a number of its processes which were found to infringe (38 F. (2d) p. 351).

### Patents –103 and –105 Are Not Prior Art to Patent –106

Judge Soper held that patents –103 and –105 did not constitute prior art against patent —106, because of common inventorship and copendency of applications and because the claimed subjects matter were distinct. In support of this holding, he found:

> "It has been held that, in the case of copending applications by the same inventor relating to the same art, it is not necessary to the validity of the claims of the later application that they should embody a patentable advance over the earlier disclosure. The test is not whether the step between the earlier and later claims required invention. It is sufficient that the claims are for separate inventions."

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* Claims 1, 3, 4, 5, 6, 8, 12, 13 and 15 are in suit, and of these, all except claim 15 (not there in suit) were held valid and infringed in the second Maryland litigation (38 F. (2d) p. 342).

(Citing Traitel Marble Co. *v.* U. T. Hungerford Brass & Copper Co., 22 F. (2d) 259, 260, (C. C. A. 2); MacGregor Co. *v.* Vaco Grip Co., 2 F. (2d) 655, 656 (C. C. A. 6); Montgomery Ward & Co. *v.* Gibbs, 27 F. (2d) 466 (C. C. A. 4); Toledo Scale Co. *v.* Computing Scale Co., 9 F. (2d) 823 (C. C. A. 6); Deister Concentrator Co. *v.* Deister Mach. Co., 263 F. 706 (C. C. A. 7); Theroz Co. *v.* United States Industrial Chemical Co., 14 F. (2d) 629, 639 (D. C. Maryland)).

"It is clear that the claims of patent 106 are not the same as the claims of the prior patents. Some of the claims of patent 106 contemplate the application of the Zulauf feature of patent 105 to a special kind of mash, and other claims of patent 106 involve a combination of the important features of patent 103 with those of patent 105. Neither of the earlier patents lays claim to a process which involved the use of the feeding process of one patent together with the neutralization of the other." (38 F. (2d) pp. 343-344)

Other cases in point are:

*The Suffolk Co.* v. *Hayden*, 3 Wall. (70 U. S.) 315, 318;

*American Hatters & Furriers Co.* v. *Danbury & Bethel Fur Co.*, 47 F. (2d) 268, 269 (aff. 54 F. (2d) 344, C. C. A. 2);

*Anderson* v. *Collins*, 122 Fed. 451, 458 (C. C. A. 8).

The Circuit Court of Appeals below makes its holding *contra* in great brevity and without citation of authority, it merely says:

"Since we have found patents Hayduck -103 and Hayduck -105 to be invalid it follows that we find this patent to be invalid, since combining the process of invalid process patents cannot result in validity." (R. I, 684)

The Circuit Court obviously erred in thus holding that patents -103 and -105 constituted prior art for any purpose against patent -106.

**The Prior Art Is Non-Anticipatory**

If, on the other hand, the Circuit Court of Appeals below meant to hold that the prior art (Henneberg, Wilfert and Pollak) which it held to invalidate Hayduck –103, *plus* the prior art (Rainer and Iwanowski), which it found to invalidate patent –105, might be combined to invalidate patent –106, then its conclusion again amounted to a holding that the existence of isolated piecemeal and vague disclosures in the prior art automatically eliminated room for the exercise of patentable invention in combining several steps into a new and useful unitary combination, despite evidence that the patented combination revolutionized the industry. Such a conclusion is equally repugnant to equity and contrary to sound established patent law, as previously held by this Court:

*Leeds & Catlin* v. *Victor Talking Machine Co.*, *supra*, p. 20;

*Parks* v. *Booth*, *supra*, p. 21).

Finally, if the Court meant to indicate that it was its holding of invalidity of the patents –103 and –105, which rendered the patent –106 invalid, then we find neither rhyme nor reason in such holding. Certainly the combination of distinct processes of separate patents into a single unitary process might involve the highest exercise of patentable invention, and how the validity or invalidity of the two separate patents could affect the question of the validity of the third is unperceivable.

In any event, the law has heretofore been applied in the cases above cited, by this Court and by the Circuit Courts of Appeals for the 2nd, 4th, 6th, 7th and 8th Circuits, contrary to the Circuit Court of Appeals for the Third Circuit herein.

## CONCLUSION

The reasoning expressed in the opinion of the Court below in finding each of the patents here on review invalid is manifestly unsound and is unwarranted either by the facts or the law of the case. Petitioner invites a careful comparison of the prior opinions in the Maryland litigations with the opinions below. It is apparent that they are in irreconcilable conflict and that the understanding of the subject matter and the application of the law which they reflect is in sharp contrast.

The Circuit Court of Appeals below found patents -103 and -105 invalid on the basis of vague, indefinite and incomplete in publications of foreign origin despite the fact that the same or substantially the same art had been before the Officials of the Patent Office, who had allowed the claims in suit thereover; and it apparently disregarded the facts that such prior art had been without any effect on the yeast manufacturing industry for many years and that the patented inventions revolutionized the industry.

As this Court said in *Diamond Rubber Co.* v. *Consolidated Rubber Tire Company*, 220 U. S. 428, 435 and 441:

> "Knowledge after the event is always easy, and problems once solved present no difficulties, indeed, may be represented as never having had any, and expert witnesses may be brought forward to show that the new thing which seemed to have eluded the search of the world was always ready at hand and easy to be seen by a merely skillful attention. But the law has other tests of the invention than subtle conjectures of what might have been seen and yet was not. It regards a change as evidence of novelty, the acceptance and utility of change as a further evidence, even as demonstration."
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> . . . . . .
>
> "That the tire is an invention is fortified by all of the presumptions, the presumption of the patent by that arising from the utility of the tire. And we have

said that the utility of a device may be attested by the litigation over it, as litigation 'shows and measures the existence of the public demand for its use.'"

As was aptly said by the Circuit Court of Appeals for the Second Circuit in the case of *O'Rourke Engineering Const. Co.* v. *McMullen et al.*, 160 Fed. 933, 939 (C. C. A. 2), above quoted, p. 18:

> "The keynote of all the decisions is the extent of the benefit conferred upon mankind. Where the court has determined that this benefit is valuable and extensive it will, we think, be difficult to find a well considered case where the patent has been overthrown on the ground of nonpatentability."

It is submitted that, as respects the validity of the Hayduck patents –103, –105, and –106, the prayer of the petition should be granted and the ruling of the Third Circuit Court of Appeals reversed.

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